
Erosion & Sediment Control Technical Bulletin #1

Improving Soil Quality in Urbanizing Areas

Background

Typical development practices in urbanizing areas leave soils with greatly diminished soil quality on which to establish lawns and landscaped areas. In the course of development, soil rich in critical organic material is often stripped, compacted, buried under subsoil, or removed and replaced with shallower depths of lower quality imported soil or fill material. Existing soil quality can be conserved by preservation and reapplication of topsoil in accordance with the *Virginia Erosion & Sediment Control Handbook* (Std & Spec 3.29 and 3.30) at a minimum, or preferably, improved by adding organic matter through addition of compost. Compost is aerobically decomposed organic waste, such as animal manure, biosolids, and yard wastes, which has a long history of use as a tool to enhance degraded soils. Increasing soil organic matter enhances the soils ability to support healthy vegetation and provides environmental and economic benefits. Further information beyond the basic benefits and recommendations outlined in this document is available from your local Conservation District, Virginia Cooperative Extension, NRCS, or DCR representative.

Benefits of Healthy Soil

- ❑ Absorbs more stormwater by increasing rainwater interception and infiltration, thereby reducing runoff, resultant erosion, and the need for costly collection and treatment BMPs.
- ❑ Reduces fertilizer, herbicide, and pesticide needs and resultant damage to water resources by:
 - Providing better nutrient holding capacity and availability, so that soils recycle nutrients over successive years in concert with the plants growth-cycle, and
 - Promoting growth of vigorous vegetation that out-competes weeds and filters sediment, chemicals, pathogens, and other contaminants before they reach surface or groundwater.
- ❑ Reduces irrigation requirements by improving moisture absorption and retention.
- ❑ Increases disease and drought resistance, and thus the lifespan of plants.
- ❑ Improved water quality aids recovery of aquatic species, and may eliminate need for costly restoration efforts.
- ❑ Encourages vigorous plants that enhance contractor's reputation and reduces call-backs.
- ❑ Healthy vegetation adds aesthetic value ("curb appeal") to properties and neighborhoods.
- ❑ Healthy plant systems purify and cool urban air.

Soil Establishment Recommendations

(1) Retention - The duff layer (leaves, twigs, detritus) and native topsoil should be retained in an undisturbed state to the maximum extent practicable. In any areas requiring grading, the duff layer and topsoil should be removed and stockpiled on site to be reapplied on their own, or preferably once amended with compost, to other portions of the site.

(2) Quality - All cleared and graded areas planned as landscaped areas or lawns **that are not** covered by impervious surface, part of a drainage facility, or engineered as structural fill or slopes (> 2:1) should demonstrate the following:

- a) The moisture infiltration rate and soil moisture holding capacity of the original undisturbed soil native to the site should be retained or enhanced. Areas that have been compacted, or where duff or underlying topsoil is removed, should be amended with compost to mitigate for lost moisture infiltration and holding capacity.
- b) A topsoil layer should be present that matches the conditions of the original undisturbed soil or has the following characteristics:
 1. Minimum depth of 4 inches
 2. pH from 6.0 to 7.0
 3. Minimum organic content of 4% dry weight
 4. Soluble salts < 500 ppm
- c) Subsoils in areas with grades less than 3:1 should be scarified at least 4 inches below the topsoil layer (2 inches on slopes > 3:1) with some incorporation of upper material when feasible. Where regular construction traffic has passed, a subsoiler should be used to a depth of 4 feet to break up traffic paths.

Note that the resulting soil must be appropriate for the physiographic region, hydrology, and chosen vegetation.

(3) Maintenance

- a) Soil should be protected from compaction, planted as soon as possible after installation, and mulched appropriately after planting.
- b) Plant debris or its equivalent should be left on the soil surface to replenish organic matter.
- c) Annual soil samples should be collected and analyzed to provide guidance on liming and fertility requirements to help maintain long-term soil and plant health.